and evident – or *perfect* – *knowledge*. The probable syllogisms befitting Scholastic controversies are granted only pedagogical value. Two paths to knowledge are posited, namely, *experience* and *deduction*; the former, which is apprehended as *a kind of observation*, is viewed as *unreliable*, but the latter, which is understood as *pure inference*, is regarded as *infallible*. The certainty of mathematical disciplines is traced to two factors, to wit, that their objects are so pure and so simple that experience cannot render these disciplines uncertain, and that these disciplines consist entirely of conclusions deduced by reason. The conclusion drawn is, not that one should do only mathematics, but that one should study only that with respect to which one can have mathematical certainty. *Therefore the question concerns the legitimacy of the claim that mathematical knowledge is the authoritative standard for all knowledge.*

According to Rule 3, one should, when examining things, investigate only those in regard to which one can achieve evident intuition or certain deduction. *The argument is that one acquires genuine knowledge only through intuition or through deduction.* Searching for knowledge in the books of the ancients has both advantages and disadvantages. For one does not become a philosopher merely by reading philosophy. The vulgar philosophy is criticized as resting on conjecture and characterized as a mishmash of vagueness and obscurity and of clarity and distinctness. But two infallible means of acquiring knowledge are posited, namely, *intuition* and *deduction*. 'Intuition' is understood, not as sensual, but as intellectual, that is, as *the indubitable conceptual act of the pure and attentive mind*. Thus there may be significant differences between the Scholastic and the Cartesian Latin terminology. Also, intuitive evidence and certainty are required of *discursive arguments* as well as of *propositional utterances*. 'Deduction' is understood – since many things are known with certainty without themselves being evident – as *a necessary conclusion of something from something else known with certainty*. Faith is considered an act, not of the intellect, but of the will, and thus it is not a reliable path to knowledge, though it yields certainty on divine revelation. *Therefore the question is going to be about the relationship between intuition and deduction as distinct and autonomous ways of knowing – that is, will there really turn out to be two of them or rather only one?*

According to Rule 4, a method is necessary for investigating the truth of things. *The argument is that one must make use of method in investigating the truth of things.* 'Method' is defined in terms of *certain and easy rules*, rules such that, by following them, one will neither suppose anything false to be true nor fail to arrive at the knowledge, not of everything without further ado, but of everything of which one is capable. But mastery of method appears to presuppose that one know *how to intuit* and *how to deduce*, since one cannot learn from the method how to perform these primary and ultimate operations. *Ancient analytic geometry* and *modern algebraic arithmetic* are described as being nothing other than 'the spontaneous fruits' which have sprung from 'the innate principles of the method'. The decisive desideratum is not the 'mathesis vulgaris' whose objects are mere figures and numbers, but rather a mathematics sui generis which contains both primary rudiments of human reason and ultimate truths pertaining to all subjects whatever. 'Mathesis universalis' is defined as that discipline which thematizes all those things in which some *order* or *measure* is examined, and which explains these things regardless of the particular or specific subject matter in which this *order* and *measure* are found.

Материал, защищенный авторским правом

The purpose of the treatise is to cultivate the theory and the praxis both of 'mathesis universalis' and of the higher sciences. *Therefore the specific question is whether methodical procedure is a necessary or a sufficient condition for achieving the truth in the sciences, and the general question is about the relationships between method, mathematics, and 'mathesis universalis' – which already are clearly not the same things.*

Section Two, consisting of Rules 5–8, focuses both on the order of the objects of knowledge and on the limits of human knowledge itself.

According to Rule 5, one should, step by step, reduce complicated and obscure propositions to simpler and clearer ones, and, by the same steps, ascend from the intuition of the simplest ones to a knowledge of all the others. *The argument is that the entire method consists in the order of the things on which one must focus the natural intelligence in order to discover any truths about them.* This rule is compared to the thread that guided Theseus through the labyrinth. Yet order may not be clear; it may be obscure. *Therefore the question is raised concerning the importance of the order of states of affairs as expressed in propositions.*

According to Rule 6, one should, in order to distinguish between the simplest things and the complicated ones and to apprehend the former in an orderly manner, observe, in each and every series of things in which one has directly deduced some truths from others, which is the most simple and how the others are more or less or equally removed from it. *The argument is about whether the pertinent order is primarily and ultimately ontological or epistemological.* The suggestion is that the arrangement of all things in certain series ensues on the basis of one consideration, to wit, what can be known from what. All relevant things are divided into *absolute* and *relative*. 'Absolute' is said to be *whatever contains within itself the pure and simple nature* in question as well as whatever is the simplest and easiest thing of all. 'Relative' is said to be *whatever participates in the simple nature* and can by virtue thereof be referred to the absolute in a definite set of relations and deduced from it in a certain series of steps. But 'absolute' is *relative*, for some absolute things are more and some are less so than others, so that one must pursue 'the most absolute'. The *most simple natures* are accessed via *intuition*; *all other natures*, via *deduction*. One must begin with the easy and proceed to the hard – intuition precedes deduction. Several elucidations illustrate this using the example of the relations between continuously proportional numbers: 3, 6, 12, 24, and 48. In conclusion, such relations are also used to illustrate the difference between the 'direct' and the 'indirect' deduction of a proposition, for example, getting from 3 and 6 to 12 versus going from 3 and 48 to 12. *Therefore the question is, not only whether the distinction between the absolute and the relative can be performed so neatly and so cleanly as to yield the required easy, pure, and simple natures, but also whether the distinction between the absolute and the relative – and thus that between the simple natures and all others – is primarily and ultimately real (in the 'ordo essendi') or conceptual (in the 'ordo cognoscendi').*

According to Rule 7, one should, in order to complete knowledge, survey, in a continuous movement of thought, all the things that relate to the pertinent project, both collectively and individually, and one should summarize them in an adequate and orderly enumeration. *The focus shifts from intuition and deduction to enumeration or induction.* The problem is that, the *longer* a chain of deductions becomes, the *harder* it becomes to preserve the integrity of the intuitions underlying them; the solution is an

Материал, защищенный авторским правом

appeal to *memory*, which is notoriously unreliable, or to *a certain continuous movement of thought*. The latter is held to be better, since a chain of deductions is only as strong as its links of intuition are weak and an interrupted survey yields a collapsed certainty. So there is no complete knowledge without adequate induction. 'Induction' is understood as *an inquiry so thorough and so careful and so accurate that one may certainly and evidently conclude from it that nothing relevant to the posed question has been overlooked*. But now *immediate deduction* appears to reduce to *intuition*, while *mediated deduction* seems to amount to *induction*. The rest of the rule avoids the issue by concentrating on induction, which must not be deficient, that is, liable to error; it must be sufficient, that is, complete and distinct. Yet whether induction needs to be complete and distinct or neither, is a pragmatic matter. Induction also has order. The order can be varied, usually, with latitude for individual choice. In conclusion, there is some – puzzling – indication that with this the core of the treatise has already been presented. *Therefore the question is whether deduction can maintain its own role in knowledge vis-à-vis both intuition and induction.*

According to Rule 8, one should, if one encounters, in a series of things to be investigated, something which the intellect cannot adequately intuit, stop there, not examining the other things which follow, but abstaining from superfluous effort. *The focus shifts from the roots of human knowledge to the limitations of the natural intelligence*. The topic of the limits of human reason leads to the question of when order is necessary and when it is useful. If one must withhold judgment, this recognition is viewed as no less knowledge than is that which reveals the nature of the thing itself. For example, someone who has studied mathematics or philosophy but not physics can only get so far in the attempt to discover the anaclastic line in dioptrics. One cannot solve the problem of the anaclastic without knowing certain other things. Here there are said to be *three modes of knowing*, namely, the *intellect*, the *fantasy*, and the *senses*. In any case, it becomes necessary to inquire as to which objects human reason is capable of knowing. But the resemblance between the procedure of the method and the procedures of the mechanical arts seems to show that these preliminaries – the *Regulæ* up until now (?) – have yielded only some rough precepts. The question concerning the nature and the limits of human knowledge relates both to *those who can know* and to *the things which can be known*. Here *the intellect alone* is supposed to be capable of knowledge, though it can be helped or hindered by *three other faculties*, namely, by the *imagination*, by the *senses*, and by the *memory*. The things themselves are divided into *most simple natures* and *complex or composite natures*. In conclusion, to apply the method in order to know something is to find what one is seeking, or to recognize why one is not finding it, or to realize that one cannot find it. *Therefore the question is how to determine both the limitations of the natural intelligence and the limits of human knowledge.*

Section Three, consisting of Rules 9–12, thematizes the connections between cognitive faculties, cognitive activities, and cognitive objects.

According to Rule 9, one should focus the natural intelligence on the smallest and easiest things, dwelling on them until one becomes accustomed to intuiting the truth distinctly and perspicuously. *The first rule to focus on intuition per se does so under the rubric of perspicacity*. The question is how best to exercise *the operation of intuition* and to cultivate *the faculty of perspicacity* in the distinct intuition of individual things. The comparison of

Материал, защищенный авторским правом